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CONCENTRATION OF GOLD FROM YUKON PLACERS

T.F. Berry
Mineral Processing Laboratory

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CONCENTRATION OF GOLD FROM YUKON PLACERS

by

T.F. Berry*

SUMMARY

A survey was undertaken of four of the small, gold-bearing, placer sand deposits in the Yukon Territory.

The operators of these claims, concerned with the possible loss of fine, free gold in the sluice-box tailings requested a complete screen analysis on samples of sluice-box feed and tailings. In addition, CANMET was asked to do a series of table concentration tests to determine whether the recovery of gold could be enhanced by the use of more sophisticated gravity concentration devices.

As is the case with most placer sands, preconcentration by the screen removal of a barren or uneconomic fraction is a prerequisite to effective gold concentration. The preconcentration point was determined by the screen analyses on the head samples.

With the exception of the 40 Mile River sand, the grades and recoveries of the placer sands were very high.

The 40 Mile River sand, with approximately 50% of the gold in the -37 µm (-400 mesh) fraction suffered in concentration. An inordinately high weight percent was removed in order to obtain a respectable recovery. The concentrate grade was thus greatly reduced.

In the following table we have selectively chosen figures from the results of each of the four concentration tests. These figures show the effect of preconcentration on grade enhancement; the percentage of gold rejected during this operation; the weight percent removed in a table cleaner concentrate and the grade and recovery in that concentrate; the

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*Senior Research Technician, Mineral Processing Laboratory, CANMET, Energy Mines and Resources Canada.

assay and percentage of gold rejected in the table rougher tailing; and the concentration ratio in the table cleaner concentrate.

A Selected Summary of Results

Product	40 Mile River	Sulphur Creek	Hunker Creek	Upper Dominion Creek
Screen discard wt %	64.860	59.868	51.184	42.642
Rejected Au %	8.42	1.29	1.41	1.13
Feed to preconc. (1) Au, oz/t	0.008	0.046	0.036	0.031
Feed to concn. (2) Au, oz/t	0.020	0.113	0.073	0.053
Table Cl conc. (3) wt %	1.89	0.237	0.187	0.125
Table Cl conc. Au, oz/t	0.342	19.067	18.820	23.824
Table ro tailing Au, oz/t	0.002	0.001	0.001	0.001
Rejected Au %	8.4	0.8	1.2	1.8
Recovery Au %	83.0	97.8	97.2	96.8
C/R (4) - Table Cl conc.	52.9:1	421.9:1	534.7:1	800:1

Note: To convert Imperial Units to S.I. Units: oz/ton x 34.285 = g/t

(1) preconc. - preconcentration
(2) concn. - concentration
(3) conc. - concentrate
(4) C/R - concentration ratio: tons of feed required to produce one ton of concentrate

CONCENTRATION DE L'OR PROVENANT DES ALLUVIONS AURIFÈRES DU YUKON

par

T.F. Berry*

RÉSUMÉ

Quatre des petits gîtes de sables aurifères du Territoire du Yukon ont fait l'objet d'une étude.

Les exploitants de ces concessions, inquiets de la perte possible d'or pur libre contenu dans les résidus du sluice, ont demandé qu'une analyse granulométrique complète des échantillons du produit de charge du sluice ainsi que des résidus soit faite. On a également demandé au CANMET d'effectuer une série d'essais de concentration sur tables dont le but était de déterminer si la récupération de l'or pouvait être améliorée avec l'utilisation d'appareils de concentration gravimétrique plus perfectionnés.

La préconcentration de la plupart des sables alluvionnaires par l'enlèvement des stériles ou des fractions sans valeur économique à l'aide d'un crible, tel qu'il en est le cas ici, est un pré-requis pour effectuer efficacement la concentration de l'or. Le niveau de préconcentration a été déterminé à l'aide d'analyses granulométriques des échantillons de produit de charge.

Exception faite du sable de la 40 Mile River, la teneur et la récupération des sables aurifères étaient très élevées.

Le sable de la 40 Mile River, contenant environ 50 % d'or dans des fractions de -37 µm (à la maille -400), accusait un manque au niveau de la concentration. On a enlevé un pourcentage en poids excessivement élevé afin d'obtenir un taux de récupération respectable. Par conséquent, la teneur du concentré a été réduite de beaucoup.

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*Technicien chercheur, Laboratoire de traitement des minéraux, CANMET, Énergie, Mines et Ressources Canada.

Le tableau suivant présente les données choisies sélectivement des résultats obtenus des quatre essais de concentration. Ces données montrent l'effet de la péconcentration sur l'amélioration de la teneur; le pourcentage d'or rejeté au cours de cette opération; le pourcentage en poids enlevé du concentré d'une table relaveuse ainsi que sur la teneur et la récupération de ce concentré; la teneur et le pourcentage de l'or rejeté dans les résidus de la dégrossisseuse; et le taux de concentration du concentré des tables relaveuses.

Résumé des résultats choisis

Produit	40 Mile River	Sulphur Creek	Hunter Creek	Upper Dominion Creek
Rejet du crible % en pds	64,860	59,868	51,184	42,642
Rejet % Au	8,42	1,29	1,41	1,13
Charge à préconc. (1) Au, oz/t	0,008	0,046	0,036	0,031
Charge au concn. (2) Au, oz/t	0,020	0,113	0,073	0,053
Conc. relaveuse (3) % en pds	1,89	0,237	0,187	0,125
Conc. relaveuse Au, oz/t	0,342	19,067	18,820	23,824
Résidus dégross. Au, oz/t	0,002	0,001	0,001	0,001
% Au rejeté	8,4	0,8	1,2	1,8
% Au récupéré	83,0	97,8	97,2	96,8
T/C (4) - conc. relaveuse	52,9:1	421,9:1	534,7:1	800:1

Nota: Pour convertir les unités impériales en unités SI: oz/t x 34,285 = g/t

(1) préconc. - préconcentration
(2) concn. - concentration
(3) conc. - concentré
(4) T/C - taux de concentration: tonnes de produit de charge nécessaire pour produire une tonne de concentré.

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INTRODUCTION

In October 1984, in liason with the Department of Indian and Northern Affairs, Northern Affairs Program, CANMET launched a survey of four of the small, gold-bearing placer sand deposits currently being mined in the Yukon Territory.

Each of these four operations employs a conventional or modified sluice-box to concentrate the gold. While this equipment will concentrate the coarser gold +74 µm (+200 mesh), its efficiency decreases markedly in the concentration of the fine, flaky gold usually associated with the mud, clay and slime fractions of the sand.

More sophisticated gravity concentration operations employ jigs, shaking tables, pinched sluices, Reichert cones, spirals and hydrocyclones.

In placer operations it is important to recognize the value of removing, by a simple relatively inexpensive screening process, a large barren or uneconomic fraction prior to the main concentration process.

OBJECT OF INVESTIGATION

Concerned with the possible loss of fine free gold in the sluice-box tailings, the operators of the four properties requested a complete screen analysis on samples of sluice-box feed and tailings. In addition, CANMET was requested to do a series of table concentration tests to determine whether the recovery of gold could be improved upon by the use of more sophisticated gravity concentration devices.

ORE SAMPLES

From each of the four operating properties, 1-45 gal. drum designated sluice-box feed and 1-45 gal drum designated sluice-box tailing were received. The samples originated from:

40 Mile River - Site A
Sulphur Creek - Site B
Hunker Creek - Site C
Upper Dominion Creek - Site D

DISCUSSION AND EVALUATION OF TEST PROCEDURES AND RESULTS

Screen Analysis

Each drum of placer sand was floor dried, mixed and riffled using a Gibson splitter to remove approximately 5000 grams for screen testing. The remainder was held in the original drums for subsequent concentration tests.

These approximate 5000 gram samples were wet screened on 14 screens from 4760 µm (4 mesh) to 37 µm (400 mesh) resulting in 15 fractions which were assayed for gold.

In addition to obtaining a calculated head on the sluice-box feed and tailing samples from each of the operations, the screen analysis determined the cut-point at which the ore could be preconcentrated, i.e., the removal of a large weight of relatively barren or at least uneconomic material.

A review of these screen analyses shows the nugget effect that took place during screening. This is an assay problem with all placer sands and is one which is very difficult to eliminate. One might have to screen 1/4 of a drum (150 lb) of material with each screen fraction being barrel amalgamated or cyanided to eliminate the assay problem.

Table 1 in the Appendix shows that 67% of the head sample is +297 µm (+48 mesh) assaying 0.137 g Au/t (0.004 oz Au/ton) and contains 5% of the gold. This large fraction should be discarded in a preconcentration step as uneconomic.

The -37 µm (-400 mesh) fraction representing 9.6% of the feed and containing 50.4% of the gold caused some concern. Although we suspected that extremely fine gold was present, these figures seemed to be disproportionately high. A recheck assay on a separate sample of the rejects from this fraction resulted in an assay of 8.228 g Au/t (0.240 oz Au/ton). Thus the conclusion was that the original assay was probably right.

Apart from the screen analysis, no concentration tests were done on the tailing sample. With a calculated assay of 0.086 g Au/t (0.0025 oz Au/ton) this material, was considered uneconomic.

In Table 2 in the Appendix, the +14 mesh fractions representing 60.0% of the head sample, assayed 0.068 g Au/t (0.002 oz Au/ton) and contained 3.0% the gold. This material should be removed prior to concentration tests.

The tailing sample was too low grade and no test work aside from the screen analysis was done on it.

Table 3 in the Appendix shows that a large fraction can be removed with only a small loss of gold. Here 49.4% of the head is in the +1190 µm (+14 mesh) fraction. It assays 0.034 g/t (0.001 g/ton) and contains 1.1% of the gold. It can easily be removed by coarse screening. 97.2% of the gold is lodged in the -1190 + 297 µm (-14 + 48 mesh) fractions.

The tailing assays 0.068 g/t (0.002 Au/ton) and is too low grade to permit test work. Sixty-six percent of the gold in the tailings reported in the +1680 µm (+10 mesh) fractions. This indicates poor sluice-box efficiency. One would expect to find this relatively coarse gold in the sluice-box concentrate.

In Table 4 in the Appendix, the +1190 µm (+14 mesh) fractions of the head sample contain 1.5% of the gold in 43.5% of the sand assaying 0.068 g/t (0.002 oz Au/ton). In this placer head sample 97.2% of the gold was contained in the four -590 + 210 µm (-20 + 65 mesh) fractions.

The tailing sample assaying a calculated 0.055 g/t (0.0016 oz/ton) was too low grade for any economic recovery system.

Preconcentration

Where only one valuable mineral is present e.g. gold, and the placer sands are simple accumulations of readily dispersed particles, lending themselves to easy separation and concentration, the recovery processes tend to be simple. Indeed, there are some highly profitable operations which only require the use of screens, pumps and sluice-boxes to produce a finished product.

Truly profitable operations preconcentrate the mined sands by screening from the feed to a sluice-box or other concentrating device, the coarsest fractions which are barren or contain gold in amounts that are uneconomic to process.

Usually a fraction in excess of 50% of the mined sand can be rejected with only a small loss of gold.

The primary reason for the screen analysis on the head sample, aside from determining the size distributions of the gold, was to determine the preconcentration cut-point.

The byproducts of such a step are the enhancing of the grade of the feed to the concentrator, the greater control of water permitted with the finer feed and the increased throughout obtained by the removal of this material.

Concentration

All gravity concentration devices are simply concerned with the recovery of heavy and the rejection of light minerals. In small operations the appeal of the sluice-box is in its simplicity of construction, maintenance and operation. Fine gold in this operation, -74 µm (-200 mesh), is often lost in the tailings.

Somewhat more sophisticated operations employing spirals, jigs, tables etc., which permit fine adjustments, will recover much of this fine gold.

In each of the four concentration tests, the results of which follow, the preconcentration cut-point was that determined by the screen analysis. In this case of the 40 Mile River sand, 297 µm (48 mesh) was settled upon. In each of the three other samples; Sulphur Creek, Hunker Creek and Upper Dominion Creek a screen size 1190 µm (14 mesh) was used.

In each case the screen oversize was removed using hard water sprays on a Sweco vibrating screen. This material was dried, weighed, sampled and assayed for gold. The screen undersize, i.e. feed to concentration, was dried, weighed and tabled.

40 Mile River

This sand contained an appreciable amount of magnetite and a rougher table concentrate was removed at the magnetite-sand interface. This was done to ensure the recovery of that extremely fine gold, -37 µm (-400 mesh) which may have slipped under and been obscured by the coarser magnetite particles.

The rougher table tailing was wet-split and assayed for gold with the weight being calculated by difference.

The rougher table concentrate was dried and the magnetics were removed by dry magnetic separation. The non-magnetics were re-tabled and the table cleaner concentrate obtained was further concentrated on a superpanner to recover the pure metallics. In the case of this sample the superpanner tailing was added to the table cleaner tailing.

The metallics were weighed and placed in a labled, stoppered bottle for possible microscopic work.

Table 1. Results of concentration test - 40 Mile River

Product	Weight %	Assays, Au		Dist. Au %
		g/t	oz/ton	
Superpanner concentrate*	68.1×10^{-6}	0.8×10^{6}	23,333	78.3
Table Cl tailing	5.38	1.611	0.047	12.3
Table Cl conc. (calcd)	5.38	11.725	0.342	90.6
Final magnetics	1.05	0.137	0.004	0.2
Table Ro. conc. (calcd)	6.43	9.840	0.287	90.8
Table Ro. tailing (wt by diff.)	93.57	0.068	0.002	9.2
-50 mesh table feed (calcd)	100.0	0.686	0.020	100.00

Table 2. Overall metallurgical Balance - 40 Mile River

Product	Weight %	Assays, Au		Dist. Au %
		g/t	oz/ton	
Superpanner concentrate*	23.9×10^{-6}	0.8×10^{6}	23,333	71.6
Table Cl tailing	1.89	1.611	0.047	11.4
Table Cl conc. (calcd)	1.89	11.725	0.342	83.0
Final magnetics	0.37	0.137	0.004	0.2
Table Ro. conc. (calcd)	2.26	9.840	0.287	83.2
Table Ro. tailing (wt by diff.)	32.88	0.068	0.002	8.4
-50 mesh table feed (calcd)	35.14	0.686	0.020	91.6
+50 mesh screen discard	64.86	0.034	0.001	8.4
Head (calculated)	100.00	0.274	0.008	100.00

*The metallics which were removed from the superpan were weighed. Assuming the metallics to be 80% Au the assay becomes 29,167 x 0.8 = 23,333 oz Au/ton

Sulphur Creek

During the table operation of the -1190 µm (-14 mesh) sand a 2-3 cm band of pyrite was observed. There was a large amount of mica in the sample. The rougher table concentrate was removed at the pyrite-mica

interface. This concentrate was immediately retabled and the table cleaner concentrate subjected to superpanner concentration. The metallics were removed and placed in a labeled, stoppered bottle for possible microscopic examination.

Table 3. Results of concentration test - Sulphur Creek

Product	Weight %	Assays, Au		Dist. Au %
		g/t	oz/ton	
Superpanner concentrate*	376×10^{-6}	0.8×10^{6}	23,333	96.6
Superpanner tailing	0.590	16.800	0.490	2.5
Table Cl conc. (calcd)	0.590	654.844	19.100	99.1
Table Cl tailing	9.320	0.034	0.001	0.1
Table Ro. conc. (calcd)	9.910	39.016	1.138	99.2
Table Ro. tailing (wt by diff.)	90.090	0.034	0.001	0.8
-14 mesh table feed (calcd)	100.000	3.874	0.113	100.00

Table 4. Overall metallurgical balance - Sulphur Creek

Product	Weight %	Assays, Au		Dist. Au %
		g/t	oz/ton	
Superpanner concentrate*	188.7×10^{-6}	0.8×10^{6}	23,333	95.3
Superpanner tailing	0.237	16.800	0.490	2.5
Table Cl conc. (calcd)	0.237	653.712	19.067	97.8
Table Cl tailing	3.740	0.034	0.001	0.1
Table Ro. conc. (calcd)	3.977	38.982	1.137	97.9
Table Ro. tailing (wt by diff.)	36.155	0.034	0.001	0.8
-14 mesh table feed (calcd)	40.132	3.874	0.113	98.7
+14 mesh screen discard	59.868	0.034	0.001	1.3
Head (calculated)	100.000	1.577	0.046	100.00

*The metallics which were removed from the superpan were weighed. Assuming the metallics to be 80% Au the assay becomes 29,167 x 0.8 = 23,333 oz Au/ton

Hunker Creek

The -1190 µm (-14 mesh) sand, during the tabling operation, showed little or no magnetite and no pyrite. The amount of gold in evidence on the table was very low, an event born out by the low calculated head of 1.817 g/t (0.053 oz/ton) shown in Table 5. The rougher table concentrate was retabled and the cleaner table concentrate further concentrated on a superpanner. The gold was retained in a labled, stoppered bottle for observation.

Table 5. Results of concentration test - Hunker Creek

Product	Weight %	Assays, Au		Dist. Au %
		g/t	oz/ton	
Superpanner concentrate*	308×10^{-6}	0.8×10^{6}	23,333	98.4
Superpanner tailing	0.383	1.337	0.039	0.2
Table Cl conc. (calcd)	0.383	644.798	18.807	98.6
Table Cl tailing	10.147	0.034	0.001	0.1
Table Ro. conc. (calcd)	10.530	23.485	0.685	98.7
Table Ro. tailing (wt by diff.)	89.470	0.034	0.001	1.3
-14 mesh table feed (calcd)	100.000	1.817	0.053	100.00

Table 6. Overall metallurgical balance - Hunker Creek

Product	Weight %	Assays, Au		Dist. Au %
		g/t	oz/ton	
Superpanner concentrate*	150×10^{-6}	0.8×10^{6}	23,333	97.0
Superpanner tailing	0.187	1.337	0.039	0.2
Table Cl conc. (calcd)	0.187	644.631	18.820	97.2
Table Cl tailing	4.953	0.034	0.001	0.1
Table Ro. conc. (calcd)	5.140	23.486	0.685	97.3
Table Ro. tailing (wt by diff.)	43.676	0.034	0.001	1.2
-14 mesh table feed (calcd)	48.816	2.504	0.073	98.5
+14 mesh screen discard	51.184	0.034	0.001	1.5
Head (calculated)	100.000	1.240	0.036	100.0

*The metallics which were removed from the superpan were weighed. Assuming the metallics to be 80% Au the assay becomes 29,167 x 0.8 = 23,333 oz Au/ton

Upper Dominion Creek

The table feed -1190 µm (-14 mesh) from this sample contained a small amount of magnetite and an appreciable amount of garnet. A rougher table concentrate was cut from the table at the garnet-sand interface and was immediately retabled to remove a table cleaner concentrate. This concentrate was further concentrated on a superpanner from which the gold was removed and retained.

Table 7. Results of concentration test - Upper Dominion Creek

Product	Weight %	Assays, Au		Dist. Au %
		g/t	oz/ton	
Superpanner concentrate*	221×10^{-6}	0.8×10^{6}	23,333	97.5
Superpaner tailing	0.217	6.514	0.190	0.8
Table Cl conc. (calcd)	0.217	820.303	23.926	98.3
Table Cl tailing	4.434	0.034	0.001	0.1
Table Ro. conc. (calcd)	4.651	38.296	1.117	98.4
Table Ro. tailing (wt by diff.)	95.349	0.034	0.001	1.6
-14 mesh table feed (calcd)	100.000	1.817	0.053	100.0

Table 8. Overall metallurgical balance - Upper Dominion Creek

Product	Weight %	Assays, Au		Dist. Au %
		g/t	oz/ton	
Superpanner concentrate*	126×10^{-6}	0.8×10^{6}	23,333	96.0
Superpanner tailing	0.125	6.514	0.190	0.8
Table Cl conc. (calcd)	0.125	816.806	23.824	96.8
Table Cl tailing	2.543	0.034	0.001	0.1
Table Ro. conc. (calcd)	2.668	38.159	1.113	96.9
Table Ro. tailing (wt by diff.)	54.690	0.034	0.001	1.8
-14 mesh table feed (calcd)	57.358	1.817	0.053	98.7
+14 mesh screen discard	42.642	0.034	0.001	1.3
Head (calculated)	100.000	1.063	0.031	100.0

*The metallics which were removed from the superpan were weighed. Assuming the metallics to be 80% Au the assay becomes 29,167 x 0.8 = 23,333 oz Au/ton

CONCLUSIONS

In spite of the obvious "nugget effect" apparent in the screen analyses tables, resulting in assay anomalies, these results do show the size distribution trend of the gold and indicate a preconcentration cut-point.

In the case of the 40 Mile River head sample, a large percentage of the gold (50.4%) was lodged in the -37 µm (-400 mesh) fraction. Gold, at this degree of fineness, is at or beyond the range at which a table can be expected to work effectively. This is particularly true when a feed contains, as this one did, an appreciable percentage of magnetite or other heavy mineral. Such minerals tend to pack behind the table riffles mitigating their effectiveness and resulting in the extremely fine, flaky gold being washed over the riffles into the tailings.

The physical dimensions of a laboratory Deister concentrating table are small. When testing an ore with the values in the finest fractions such a table requires extreme care in its operation. The short particle residence time on the table deck requires a careful control of the table speed and inclination, very low feed rates and an extemely judicious application of wash water.

In the case of the 40 Mile River sample, in spite of the above mentioned precautions, 8.53% of the gold reported in the table rougher tailing. To obtain a respectable table cleaner concentrate recovery from this placer sand (82.86%) it was necessary to remove an inordinately large weight percent. This of course drastically reduced the grade of the final concentrate.

The three other samples tested, with the gold in the coarser screen fractions, presented no difficulty in obtaining high grades and recoveries in very low weight percentages.

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APPENDIX

RESULTS OF SCREEN ANALYSIS

Table 1. Screen analysis - 40 Mile River placer sand

Product		Head				Tailing			
µm	Mesh	Weight %	Au g/t	Au oz/ton	Au Dist. %	Weight %	Au g/t	Au oz/ton	Au Dist. %
4760	+ 4	20.4	0.068	0.002	0.8	2.9	0.068	0.002	2.4
2380	+ 8	10.1	0.206	0.006	1.2	15.2	0.034	0.001	6.0
1680	+ 10	5.5	0.068	0.002	0.2	7.3	0.034	0.001	2.8
1190	+ 14	2.6	0.068	0.002	0.2	6.5	0.034	0.001	2.8
840	+ 20	8.8	0.068	0.002	0.4	7.9	<0.034	<0.001	3.2
590	+ 28	6.5	0.446	0.013	1.5	8.8	<0.034	<0.001	3.6
420	+ 35	2.2	0.176	0.005	0.2	9.1	<0.034	<0.001	3.6
297	+ 48	10.4	0.106	0.003	0.5	9.0	0.068	0.002	7.3
210	+ 65	4.8	0.583	0.017	1.5	6.5	0.034	0.001	2.8
149	+100	2.9	0.857	0.025	1.3	4.8	0.377	0.011	21.3
105	+150	5.2	6.617	0.193	19.1	5.1	0.137	0.004	8.0
74	+200	3.4	9.497	0.277	17.9	4.2	0.377	0.011	18.5
53	+270	3.0	2.194	0.064	3.6	2.9	0.103	0.003	3.6
37	+400	4.1	0.514	0.015	1.2	3.8	0.103	0.003	4.4
-37	-400	9.6	9.428	0.275	50.4	6.0	0.137	0.004	9.7
Total (calcd)		100.0	1.783	0.052	100.0	100.0	0.086	0.0025	100.0

Table 2. Screen analysis - Sulphur Creek placer sand

Product		Head				Tailing			
µm	Mesh	Weight %	Au g/t	Au oz/ton	Au Dist. %	Weight %	Au g/t	Au oz/ton	Au Dist. %
4760	+ 4	34.3	0.068	0.002	1.7	25.7	<0.034	<0.001	17.3
2380	+ 8	15.9	0.068	0.002	0.8	12.7	0.034	0.001	8.7
1680	+ 10	5.8	0.068	0.002	0.3	7.1	0.068	0.002	9.3
1190	+ 14	4.0	0.068	0.002	0.2	6.0	0.068	0.002	8.0
840	+ 20	3.8	31.542	0.920*	84.2	6.3	<0.034	<0.001	4.0
590	+ 28	3.4	0.171	0.005	0.4	5.6	0.068	0.002	7.3
420	+ 35	2.6	3.223	0.094*	5.9	4.2	0.034	0.001	2.7
297	+ 48	3.3	1.187	0.053*	4.2	6.0	0.034	0.001	4.0
210	+ 65	3.5	0.103	0.003	0.3	4.8	0.034	0.001	3.3
149	+100	3.2	0.548	0.016	1.2	3.7	0.034	0.001	2.7
105	+150	5.2	0.034	0.001	0.1	5.7	0.171	0.005	19.3
74	+200	3.6	0.103	0.003	0.3	3.2	0.034	0.001	2.0
53	+270	4.6	0.068	0.002	0.2	2.2	0.068	0.002	2.7
37	+400	3.6	0.034	0.001	0.1	3.2	0.068	0.002	4.0
-37	-400	3.2	0.068	0.002	0.1	3.6	0.068	0.002	4.7
Total (calcd)		100.0	1.440	0.042	100.0	100.0	0.051	0.0015	100.0

*These three fractions containing 94.3% of the gold in the head were suspect and were re-assayed. In each re-assay the results were higher; i.e. 1.540, 0.230 and 0.150 oz/ton. This is a good example of the "nugget effect"; and points up the difficulty of obtaining definitive results using conventional sampling and assay procedures.

Table 3. Screen analysis - Hunker Creek placer sand

Product		Head				Tailing			
µm	Mesh	Weight %	Au g/t	Au oz/ton	Au Dist. %	Weight %	Au g/t	Au oz/ton	Au Dist. %
4760	+ 4	27.7	0.034	0.001	0.6	30.1	0.068	0.002	30.3
2380	+ 8	13.0	0.034	0.001	0.3	22.2	0.068	0.002	22.1
1680	+ 10	5.1	0.034	0.001	0.1	9.1	0.103	0.003	13.6
1190	+ 14	3.6	0.034	0.001	0.1	5.9	0.068	0.002	6.0
840	+ 20	3.6	0.034	0.001	0.1	4.6	0.068	0.002	4.5
590	+ 28	3.2	32.571	0.950	69.5	3.9	0.103	0.003	6.0
420	+ 35	2.8	4.457	0.130	8.3	3.4	0.034	0.001	1.5
297	+ 48	4.2	6.857	0.200	19.2	4.5	0.034	0.001	2.5
210	+ 65	4.9	0.034	0.001	0.1	4.4	0.034	0.001	2.0
149	+100	3.9	0.034	0.001	0.1	3.2	0.034	0.001	1.5
105	+150	4.9	0.068	0.002	0.2	3.1	0.034	0.001	1.5
74	+200	3.5	0.068	0.002	0.2	1.8	0.034	0.001	1.0
53	+270	3.3	0.068	0.002	0.2	1.0	0.137	0.004	2.0
37	+400	4.5	0.068	0.002	0.2	1.3	0.137	0.004	2.5
-37	-400	11.8	0.103	0.003	0.8	1.5	0.137	0.004	3.0
Total (calcd)		100.0	1.508	0.044	100.0	100.0	0.068	0.002	100.0

Table 4. Screen analysis - Upper Dominion Creek placer sand

Product		Head				Tailing			
µm	Mesh	Weight %	Au g/t	Au oz/ton	Au Dist. %	Weight %	Au g/t	Au oz/ton	Au Dist. %
4760	+ 4	23.6	0.068	0.002	0.8	16.0	<0.034	<0.001	10.0
2380	+ 8	11.2	0.068	0.002	0.4	17.1	<0.034	<0.001	10.7
1680	+ 10	4.9	0.068	0.002	0.2	10.1	<0.034	<0.001	6.3
1190	+ 14	3.8	0.068	0.002	0.1	8.7	0.034	0.001	5.6
840	+ 20	4.5	0.068	0.002	0.2	9.3	<0.034	<0.001	5.6
590	+ 28	5.4	29.828	0.870	84.1	10.3	0.034	0.001	6.3
420	+ 35	6.8	0.034	0.001	0.1	9.6	0.034	0.001	6.3
297	+ 48	10.2	0.034	0.001	0.2	9.2	<0.034	<0.001	5.6
210	+ 65	8.9	2.743	0.080	12.8	5.4	0.034	0.001	3.1
149	+100	3.9	0.034	0.001	0.1	2.0	0.823	0.024	30.0
105	+150	5.5	0.068	0.002	0.2	1.1	0.240	0.007	5.0
74	+200	2.8	0.171	0.005	0.2	0.4	0.446	0.013	3.1
53	+270	1.5	0.103	0.003	0.1	0.2	0.206	0.006	0.6
37	+400	2.1	0.206	0.006	0.2	0.2	0.137	0.004	0.6
-37	-400	4.9	0.103	0.003	0.3	0.4	0.137	0.004	1.2
Total (calcd)		100.0	1.920	0.056	100.0	100.0	0.055	0.0016	100.0